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SAWTIMBER AND CORDWOOD VOLUMES IN NORTH GEORGIA

A Progress Report

by

THE SOUTHERN FOREST SURVEY

I. F. Eldredge

Regional Survey Director

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SOUTHERN FOREST EXPERIMENT STATION

E. L. Demmon, Director

New Orleans, La.

INDEXED

FOREWORD

The nation-wide Forest Survey, being made by the United States Forest Service, was authorized by the McSweeney-McNary Forest Research Act of 1928. Its five-fold object is: (1) to make an inventory of the present supply of timber and other forest products, (2) to ascertain the rate at which this supply is being increased through growth, (3) to determine the rate at which this supply is being diminished through industrial and local use, windfall, fire, and disease, (4) to determine the present requirement and the probable future trend in the requirement for timber and other forest products, and (5) to correlate these findings with existing and anticipated economic conditions, in order that policies can be formulated for the effective use of land suitable for forest production.

In the South, the Forest Survey functions as an activity of the Southern Forest Experiment Station with headquarters at New Orleans, La.

This release contains Forest Survey data that will be included in complete reports to be published later. It should therefore be regarded as a progress report. Although considered reliable, the data are subject to correction or amplification as the work of computation proceeds.

Staff Assignment

Preparation of Report
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SAWTIMBER AND CORDWOOD VOLUMES IN NORTH GEORGIA

This report deals with a group of 21 counties in north Georgia with a total land area of 4,267,500 acres (see accompanying map). The land-use and forest data given in this release were obtained by the Forest Survey in its forest inventory made the latter part of 1935, but the information concerning forest industries was obtained as recently as 1937.

Into the northeast corner of this Survey unit extends the southern end of the Appalachian Mountains, which rise sharply from the valleys on the west and from the Piedmont Plateau on the southeast. The highest point, Brasstown Bald, on the boundary between Union and Towns Counties, is 4,768 feet above sea level; and a number of other peaks rise above 4,000 feet. The Piedmont varies from rugged at the foot of the mountains to broadly rolling in the southeastern and south-central parts of the unit. The "Valley," as it is called locally, occupies most of the western part of the unit, and although it lies at a lower elevation than the surrounding country, it is composed of a succession of minor valleys separated by ridges or low mountains. In the northwest corner, in Dade County and parts of Walker and Chattooga, are two broad, flat-topped ranges that form part of the Lookout Plateau.

The greater part of the highlands is included in the Chattahoochee National Forest. This national forest includes within its boundaries 1,165,000 acres, of which 514,777 are under Federal ownership and administration or in process of acquisition. It was organized out of those parts of the Cherokee and Nantahala National Forests which lay in Georgia and which were established for watershed-protection purposes under the Weeks Law of 1911; these areas were subsequently extended under the Clarke-McNary Law of 1924, which authorizes the purchase of land by the Federal Government for purposes of timber production as well as for watershed protection. Two additional national-forest purchase areas, totaling 393,000 acres have been located in this portion of the State, one east and northeast of Summerville in the Valley, and the other on Lookout Plateau.

The climate in this portion of Georgia is characterized by moderate summers and mild winters. The sweep of moisture-laden winds from the Gulf of Mexico and from the Atlantic Ocean against the mountains is the cause of a large annual rainfall — upward from 60 inches at Dahlonega, Rabun, and Clayton. Drainage is through the Tennessee, Coosa, Chattahoochee, and Savannah Rivers or their tributaries.

Most of the principal cities and towns, of which Rome is the largest (1930 pop. 21,843), are situated in or near the Valley. The principal activities are agriculture, textile manufacture, mining, and the production of lumber and other wood products. This section is served by the lines of seven railroads: the Louisville and Nashville; the Southern; the Nashville, Chattanooga, and St. Louis; the Central of Georgia; the Tennessee, Alabama, and Georgia; the Tallulah Falls; and the Seaboard Air Line. There are approximately 500 miles of paved or surface-treated highways in the unit, as well as a much greater mileage of secondary roads.

As shown in table 1, two-thirds of the land area in this portion of the State is given over to forest growth, which in general, occupies the steeper slopes; while practically all of the agricultural land is in the valleys or on the gentle or moderate slopes. Of the 34 percent of the combined forest and agricultural area that is level or has a gentle slope, only slightly more than one-third is in forest; of the 38 percent that has a moderate slope, three-quarters is in forest; and of the 28 percent that has steep slopes, 98 percent is occupied by forest growth.

Table 1. -- Land area classified according to use

Land use	Area		Portion of total area	
	Acres		Percent	
Forest		2,835,300		66.4
Agriculture:				
In cultivation:				
Old cropland	932,100		21.8	
New cropland	22,700		.5	
Out of cultivation:				
Idle	156,400		3.7	
Abandoned	84,400		2.0	
Improved pasture	152,500		3.6	
Total agriculture		1,348,100		31.6
Other areas		84,100		2.0
Total land area		4,267,500		100.0

Description of the Forest

The pines and hardwoods are represented almost equally in the forests of north Georgia. As shown on the map, pine and mixed pine-hardwood forests are more or less characteristic of the entire area. Pure hardwood stands are confined largely to the upper slopes of the higher mountains and to stream bottoms. Shortleaf pine is the most common coniferous species, but loblolly pine and Virginia pine are also widely distributed. Less common conifers here are longleaf pine, northern white pine, mountain pine, pitch pine, hemlock, and cedars.

Of the hardwoods, oaks and hickories occur generally, while yellow poplar, gums, and maple are common in stream bottoms, on lower slopes, and in sheltered coves. Less frequently found hardwoods include black locust, elm, ash, basswood, and beech. Most of the chestnut trees, formerly common in the mountains, have been killed out by the chestnut-blight disease. The best stands of hardwood timber usually occur in coves on the north sides of ridges, where moisture, temperature, and soil conditions are more favorable

to growth; while the tops of the higher ridges are often occupied by more or less stunted stands of hardwoods of low economic value.

In table 2, in which the forest area of the region is classified according to forest type-group and forest condition, it will be observed that second growth occupies by far the largest part of the forest area--87 percent.

Table 2. -- Forest area classified according to forest condition and forest type-group

Forest condition	Forest type-group			Total all types	Percent of total
	Pine	Pine-hardwoods	Hardwoods		
	Acres				
Old growth:					
Uncut	36,800	23,400	138,400	198,600	7.0
Partly cut	36,700	20,400	94,600	151,700	5.4
Total	73,500	43,800	233,000	350,300	12.4
Second growth:					
Sawlog size:					
Uncut	510,600	192,400	331,500	1,034,500	36.5
Partly cut	165,800	71,100	82,900	319,800	11.3
Under sawlog size:					
Uncut	252,500	282,300	355,000	889,800	31.3
Partly cut	43,000	49,300	57,100	149,400	5.3
Reproduction	47,000	25,800	10,900	83,700	2.9
Total	1,018,900	620,900	837,400	2,477,200	87.3
Clear-cut	4,700	1,500	1,600	7,800	.3
Total all conditions	1,097,100	666,200	1,072,000	2,835,300	100.0
Percent of total	38.7	23.5	37.8	100.0	

Volume Estimates

In showing the volume of the forest inventory in this Survey unit, two estimates are given: (1) the board-foot contents of the stand of sound sawlog-size trees, as measured by the Doyle log rule; and (2) the cubic volume of all trees 5.0 inches or more in diameter at breast height (d.b.h.) outside bark, including the trees covered in the board-foot estimate. 1/ Both estimates are net, that is, allowance has been made for material that would be left in the woods because of rot, fire-scar, crook, limbiness, and similar defects. In the sawtimber estimates, allowance has also been made for mill cull. Because the chestnut has been ravaged by the blight and very few trees of this species remain alive, chestnut is not included in either the board-foot or cordwood estimates, but a rough estimate of its sound volume is given in the discussion on cordwood.

The sawtimber stand of the unit, shown in table 3, totals over $3\frac{1}{4}$ billion board feet (Doyle), of which about 2 billion feet is pine and $1\frac{1}{4}$ billion feet is hardwood. Second-growth stands contain 81 percent of the pine and 55 percent of the hardwood sawtimber.

Table 4 shows the total volume of sound material in both sound and cull trees, expressed in standard (4 x 4 x 8 feet) cords. Of the total (35 million cords), 28 million cords are in good trees, almost equally divided between the pines and hardwoods. Oaks and hickories make up a large portion of the hardwood volume, while less than one-sixth is in species considered suitable for pulping (i.e., yellow poplar, gums, maple, basswood, etc.). Of the 7 million cords of sound material in cull trees, the greater portion is in hardwood species. In addition to the volume shown in table 4, it is estimated that there are 2-3/4 million cords of sound chestnut in this unit, the major portion of which is in dead trees.

Average-Acre Volumes

Table 5 shows the cordwood volume on the average acre of each forest type-group and forest condition. This volume is a mathematical average derived by dividing the volume in the forest stands in each classification by the total number of acres. This table thus provides a means of comparing the different type-groups with respect to species composition, diameter distribution, and average density. It consequently offers a means of determining the approximate cordwood volumes on large areas in this unit, if the areas in the various type-groups and forest conditions have been determined.

1/ In arriving at the above estimates, four general classes of live trees were recognized: (1) sound sawlog-size trees, (2) sound under-sawlog-size trees, (3) sound cull trees, and (4) rotten cull trees. Only the first group is included in the sawtimber estimate. A sound sawlog-size tree is defined as a pine 9.0 or more inches, or a hardwood 13.0 or more inches d.b.h. (outside bark) that contains at least one usable 12-foot log and that will yield at least 50 percent of its gross volume in sound material; a sound under-sawlog-size tree is one that gives promise of becoming a sawtimber tree; a sound cull tree is one that is not, or will not become, a sawtimber tree, owing to poor form, crook, knots, extreme limbiness, or other similar defects; while a rotten cull tree is one not sufficiently sound for it to be placed in any of the other classifications.

Table 3. -- Net sawtimber volume (Doyle scale)

Species-group	Forest condition		Total
	Old growth	Second growth	
	- - - Thousand feet board measure - - -		
Shortleaf pine[1/]	223,000	960,600	1,183,600
Loblolly and longleaf pines	48,100	424,800	472,900
Virginia pine	28,900	190,100	219,000
White pine	23,900	106,500	130,400
Hemlock and cedars	74,200	9,300	83,500
Total conifers	398,100	1,691,300	2,089,400
Yellow poplar	78,200	78,400	156,600
Gums, red maple, basswood, cucumber magnolia, etc.	35,700	54,200	89,900
Northern red oak	74,300	44,100	118,400
Other red oaks	103,900	271,000	374,900
White oak	83,900	73,700	157,600
Chestnut oak	99,800	79,200	179,000
Hickory	62,500	58,900	121,400
Elm, hard maple, ash, beech, etc.	17,700	21,100	38,800
Total hardwoods	556,000	680,600	1,236,600
Total all species	954,100	2,371,900	3,326,000

1/ Includes mountain and pitch pine.

Table 4. -- Net cordwood volume of pulping and nonpulping species

Species-group	Good trees			Sound and rotten culls	Total	Percent of total
	Under 13 inches d.b.h.	13 inches and larger d.b.h.				
		Sawlog material	Tops and limbs 1/			
	Cords					
Conifers:						
Shortleaf pine	6,768,700	1,795,500	166,800	252,200	8,983,200	25.5
Longleaf & loblolly pines	1,474,000	1,060,900	88,300	209,800	2,833,000	8.0
Virginia pine	1,377,200	395,700	58,200	433,200	2,264,300	6.4
White pine, hemlock & cedar	196,600	520,700	42,300	19,400	779,000	2.2
Total conifers	9,816,500	3,772,800	355,600	914,600	14,859,500	42.1
Pulping hardwoods:						
Yellow poplar	458,600	514,500	300,900	142,000	1,416,000	4.0
Gums, red maple, basswood, cucumber magnolia, etc.	503,400	326,800	182,600	686,100	1,698,900	4.8
Total pulping hdwds.	962,000	841,300	483,500	828,100	3,114,900	8.8
Nonpulping hardwoods:						
Oak, hickory, elm, hard maple, ash, beech, etc.	6,291,400	3,601,000	2,091,100	5,330,700	17,314,200	49.1
Total all hardwoods	7,253,400	4,442,300	2,574,600	6,158,800	20,429,100	57.9
Total all species	17,069,900	8,215,100	2,930,200	7,073,400	35,288,600	100.0
Percent of total	48.4	23.3	8.3	20.0	100.0	

1/ Includes tops only of pines but tops and limbs of hardwoods.

Table 5. -- Net cordwood volume on an average acre, classified by forest type-group, species-group, and forest condition

Forest type- and species-group	Old growth		Second growth					Clear-cut	All conditions (weighted averages)
	Uncut	Partly cut	Sawlog size		Under sawlog size		Reproduction		
			Uncut	Partly cut	Uncut	Partly cut			
	Cords								
Pine type-group:									
Pines	14.0	10.9	13.9	10.8	4.0	3.7	.1	.4	10.0
Pulping hardwoods	.2	.1	.3	.2	-	-	-	.2	.2
Nonpulping hardwoods	1.5	1.7	1.7	1.2	.2	.5	.1	.1	1.1
All species	15.7	12.7	15.9	12.2	4.2	4.2	.2	.7	11.3
Pine-hardwood type-group:									
Pines	8.7	6.4	6.3	4.6	1.9	1.6	.1	-	3.8
Pulping hardwoods	.6	.7	.8	1.2	.4	.3	-	.6	.6
Nonpulping hardwoods	4.5	4.7	4.2	4.6	1.9	1.6	.1	.4	2.9
All species	13.8	11.8	11.3	10.4	4.2	3.5	.2	1.0	7.3
Upland hardwood type-group:									
Pines	.6	.6	.4	.5	.3	.3	-	-	.4
Pulping hardwoods	1.4	1.1	.7	.6	.4	.2	.2	-	.7
Nonpulping hardwoods	8.8	8.0	7.1	6.4	4.5	4.8	.2	-	6.2
All species	10.8	9.7	8.2	7.5	5.2	5.3	.4	-	7.3
Bottomland hardwood type-group:									
Pines	3.8	1.0	.6	.9	.2	.2	-	-	1.1
Pulping hardwoods	8.0	6.5	7.8	3.2	3.2	.6	-	-	5.7
Nonpulping hardwoods	8.0	8.5	7.5	4.1	2.8	7.5	-	-	6.1
All species	19.8	16.0	15.9	8.2	6.2	8.3	-	-	12.9
All types (weighted averages):									
Pines	4.3	3.9	8.2	6.8	1.8	1.7	.1	.3	4.9
Pulping hardwoods	1.6	1.2	.7	.6	.4	.2	-	.2	.6
Nonpulping hardwoods	6.9	6.1	3.9	3.2	2.4	2.5	.1	.1	3.5
All species	12.8	11.2	12.8	10.6	4.6	4.4	.2	.6	9.0

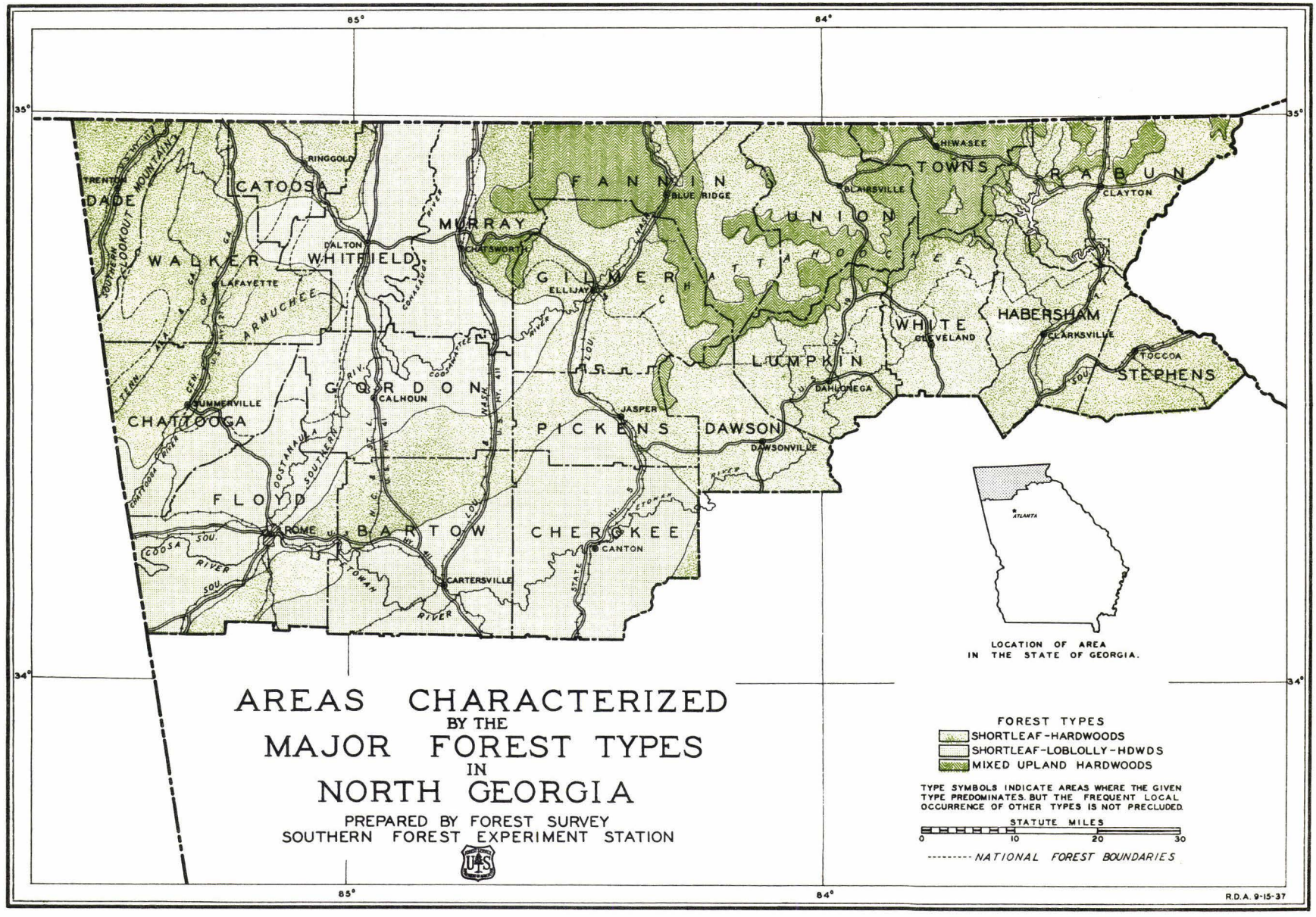
Forest Industries

In the early part of 1937, the forest industries in this portion of the State included 345 small sawmills and 11 establishments producing staves, heading, package veneer, or shuttle-blocks. In addition, a pulp mill at Canton, North Carolina, draws pulpwood from the area. A fairly large volume of logs goes into the production of railroad cross ties within the area, while a smaller volume of logs, bolts, and tan-bark is produced for nearby plants in Tennessee and North Carolina. The sawmills were cutting principally pine, which is also used for pulpwood, heading, veneer, and cross ties. The hardwoods, principally oak and poplar, with lesser amounts of gum, hickory, ash, and dogwood, are cut for lumber, cross ties, veneer, handle stock, and cooperage. The use of wood for fuel and for farm purposes also accounts for a considerable consumption of wood in this section.

The activities of individual forest-products establishments or timber operators in north Georgia are usually on a comparatively small scale. Many of the operations are intermittent and designed to utilize slack periods in farming, which is frequently on a subsistence basis. Since many farmers are dependent upon such work for supplementary income, this is one of many reasons why it is important that the forest lands of this section be maintained in a productive condition. Also on a considerable portion of these forest lands, the establishment and maintenance of a full cover of vegetation for the protection of water sheds, for the prevention of erosion, and for the regulation of stream-flow is fully as important as (or even more important than) the production of timber.

That there is a general need for improvement in the forest stands in this portion of the State is indicated by the fact that most of the present stands include a high proportion of material that is suited only for low-grade lumber, cross ties, and fuelwood, or for similar products of low value. The prevailing cutting practices usually give little or no thought to maintaining the growing stock, much less to increasing it, and have even reduced the volume per acre as well as the average size and quality of the trees available for cutting. What is most needed in this section, as in most parts of the Lower South, is better woodland management, in which the owner will improve his stands by the removal of cull trees, slow-growing trees, and trees of inferior species, and will practice good business judgment in holding his sound trees of good species to grow to sizes that produce higher values. Better fire protection is also much needed. All these measures together would gradually and appreciably increase the sustained-yield possibilities of the area in regard to both the volume and the quality of material that might be cut.

On the Chattahoochee National Forest these improved management and cutting practices have already produced excellent results, but on the majority of privately owned forest lands comparatively little has yet been done to make the continuous production of forest crops the profitable business it might be. With their favorable natural conditions and proximity to the growing industrial regions of the Southeast, there is no reason why the forest lands of north Georgia should not repay the intensive efforts necessary to develop their full possibilities.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WHITE
LUMPKIN
STEPHENS
GORDON
CHATTOOGA
FLOYD
PICKENS
DAWSON
BARTOW
CHEROKEE
TRENTON
RINGGOLD
DALTON
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ELLIJAY
BLUE RIDGE
BLAIRSVILLE
HIWASSEE
CLAYTON
CLEVELAND
CLARKSVILLE
TOCCOA
DAHLONEGA
SUMMERVILLE
CALHOUN
JASPER
DAWSONVILLE
ROME
CANTON
CARTERSVILLE
ATLANTA
LOCATION OF AREA
IN THE STATE OF GEORGIA.
AREAS CHARACTERIZED
BY THE
MAJOR FOREST TYPES
IN
NORTH GEORGIA
PREPARED BY FOREST SURVEY
SOUTHERN FOREST EXPERIMENT STATION
FOREST TYPES
SHORTLEAF-HARDWOODS
SHORTLEAF-LOBLOLLY-HDWDS
MIXED UPLAND HARDWOODS
TYPE SYMBOLS INDICATE AREAS WHERE THE GIVEN TYPE PREDOMINATES. BUT THE FREQUENT LOCAL OCCURRENCE OF OTHER TYPES IS NOT PRECLUDED.
STATUTE MILES
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NATIONAL FOREST BOUNDARIES
R.D.A. 9-15-37